

WHAT IS CLAIMED IS:

1. A method for interfacing with a surface within a computer-aided drawing environment, comprising:

determining that a plurality of curves operable  
5 to define the surface constitute a  $P \times 1$  surface condition, a  $P \times 1$  surface condition being defined by a number of first curves equal to  $P$  and only one second curve, wherein  $P$  is an integer greater than zero;

in response to determining that a plurality of  
10 curves constitute a  $P \times 1$  surface condition, converting the  $P \times 1$  surface condition into an  $N \times M$  surface condition, an  $N \times M$  surface condition being defined by a number of third curves equal to  $N$  and a number of fourth curves equal to  $M$ , wherein  $N$  and  $M$  are integers greater  
15 than one;

constructing an  $N \times M$  surface under the  $N \times M$  surface condition; and

modifying the  $N \times M$  surface to edit a drawing.

20 2. The method of Claim 1, wherein converting the  $P \times 1$  surface condition into an  $N \times M$  surface condition comprises generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of a surface having the  $P \times 1$  surface condition and compatible  
25 with the number of first curves and the only one second curve that define the  $P \times 1$  surface condition.

30 3. The method of Claim 1, wherein converting the  $P \times 1$  surface condition into an  $N \times M$  surface condition comprises generating an  $N \times M$  surface condition to replace the  $P \times 1$  surface condition.

4. The method of Claim 1, wherein converting the  $P \times 1$  surface condition into an  $N \times M$  surface condition comprises generating an  $N \times M$  surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

10 5. The method of Claim 1, and further comprising processing the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

15 6. The method of Claim 1, and further comprising modifying additional surfaces having the  $N \times M$  surface condition to edit the drawing.

7. A method for interfacing with a surface within a computer-aided drawing environment, comprising:

determining that a plurality of curves operable to define the surface constitute a  $P \times 1$  surface condition, a  $P \times 1$  surface condition being defined by a number of first curves equal to  $P$  and only one second curve, wherein  $P$  is an integer greater than zero;

in response to determining that a plurality of curves constitute a  $P \times 1$  surface condition, converting

the  $P \times 1$  surface condition into an  $N \times M$  surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of a surface having the  $P \times 1$  surface condition and compatible with the number of first curves and the only one second curve that define the  $P \times 1$  surface condition, an  $N \times M$  surface condition being defined by a number of third curves equal to  $N$  and a number of fourth curves equal to  $M$ , wherein  $N$  and  $M$  are integers greater than one;

constructing an  $N \times M$  surface under the  $N \times M$  surface condition; and

modifying the  $N \times M$  surface to edit a drawing.

8. The method of Claim 7, wherein converting the  $P \times 1$  surface condition into an  $N \times M$  surface condition comprises generating an  $N \times M$  surface condition to replace the  $P \times 1$  surface condition.

9. The method of Claim 7, wherein converting the  $P \times 1$  surface condition into an  $N \times M$  surface condition comprises generating an  $N \times M$  surface condition defined

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by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

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10. The method of Claim 7, and further comprising processing the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the  
10 second curve.

11. The method of Claim 7, and further comprising modifying additional surfaces having the  $N \times M$  surface condition to edit the drawing.

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12. An apparatus for interfacing with a surface within a computer-aided drawing environment, comprising:

a software program stored on a computer readable medium and operable, when executed on a processor, to:

5 determine that a plurality of curves operable to define the surface constitute a  $P \times 1$  surface condition, a  $P \times 1$  surface condition being defined by a number of first curves equal to  $P$  and only one second curve, wherein  $P$  is an integer greater than zero;

10 in response to determining that a plurality of curves constitute a  $P \times 1$  surface condition, convert the  $P \times 1$  surface condition into an  $N \times M$  surface condition, an  $N \times M$  surface condition being defined by a number of third curves equal to  $N$  and a number of fourth curves equal to  $M$ , wherein  $N$  and  $M$  are integers greater than one;

15 20 construct an  $N \times M$  surface under the  $N \times M$  surface condition; and

allow modification of the  $N \times M$  surface to edit a drawing.

25 30 13. The apparatus of Claim 12, wherein the software program is operable to convert the  $P \times 1$  surface condition into an  $N \times M$  surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of a surface having the  $P \times 1$  surface condition and compatible with the number of first curves and the only one second curve that define the  $P \times 1$  surface condition.

14. The apparatus of Claim 12, wherein the software program is operable to convert the  $P \times 1$  surface condition into an  $N \times M$  surface condition by generating  
5 an  $N \times M$  surface condition to replace the  $P \times 1$  surface condition.

15. The apparatus of Claim 12, wherein the software program is operable to convert the  $P \times 1$  surface  
10 condition into an  $N \times M$  surface condition by generating an  $N \times M$  surface condition defined by the third and fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first  
15 and second curves.

16. The apparatus of Claim 12, wherein the software program is operable to process the first curves and the second curve so that each one of the first curves and the  
20 second curve are compatible with each other of the first curves and the second curve.

17. The apparatus of Claim 12, wherein the software program is operable to modify additional surfaces having  
25 the  $N \times M$  surface condition to edit the drawing.

18. A system for interfacing with a surface within a computer-aided drawing environment, comprising:

a computer system having a display unit and an input device;

5 a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to:

10 determine that a plurality of curves operable to define the surface constitute a  $P \times 1$  surface condition, a  $P \times 1$  surface condition being defined by a number of first curves equal to  $P$  and only one second curve, wherein  $P$  is an integer greater than zero;

15 in response to determining that a plurality of curves constitute a  $P \times 1$  surface condition, convert the  $P \times 1$  surface condition into an  $N \times M$  surface condition, an  $N \times M$  surface condition being defined by a number of third curves equal to  $N$  and a number of fourth curves equal to  $M$ , wherein  $N$  and  $M$  are integers greater than one;

20 construct an  $N \times M$  surface under the  $N \times M$  surface condition; and

25 allow modification of the  $N \times M$  surface to edit a drawing.

19. The system of Claim 18, wherein the software program is operable to convert the  $P \times 1$  surface condition into an  $N \times M$  surface condition by generating 30 at least one auxiliary curve that is substantially continuous with any adjoining surfaces of a surface

having the  $P \times 1$  surface condition and compatible with the number of first curves and the only one second curve that define the  $P \times 1$  surface condition.

5        20. The system of Claim 18, wherein the software program is operable to convert the  $P \times 1$  surface condition into an  $N \times M$  surface condition by generating an  $N \times M$  surface condition to replace the  $P \times 1$  surface condition.

10        21. The system of Claim 18, wherein the software program is operable to convert the  $P \times 1$  surface condition into an  $N \times M$  surface condition by generating an  $N \times M$  surface condition defined by the third and  
15 fourth curves such that the third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves.

20        22. The system of Claim 18, wherein the software program is operable to process the first curves and the second curve so that each one of the first curves and the second curve are compatible with each other of the first curves and the second curve.

25        23. The system of Claim 18, wherein the software program is operable to modify additional surfaces having the  $N \times M$  surface condition to edit the drawing.